

CHANDRAYAAN-II

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WHAT IS CHANDRAYAAN - 2 ?

- ◉ Chandrayaan-2 is India's second lunar exploration mission after Chandrayaan-1.
- ◉ It is developed by ISRO (Indian Space Research Organisation).
- ◉ It is completely indigenous mission.

OBJECTIVE AND MISSION

- ◉ Similar to majority of moon missions, orbital or landing, Chandrayaan-2 will **study the elemental materials present in moon's exosphere and surface**. Difference from Chandrayaan-1 will be the close-field study of moon's surface and materials.
- ◉ The mission is strategically placed on Southern pole of Moon to increase chances of finding water in yet unexplored area , to ascertain the circulation patterns, if any. So now the question is not about finding water, it is about finding how much.

OBJECTIVE AND MISSION

- One of the main mission is to find out how much $\text{He}(3)$ atom is available so that we can extract it and use it as a fuel by nuclear fission mission.

DESIGN OF CHANDRAYAAN-2

ORBITER

- ◉ The orbiter will orbit the Moon at an altitude of 100 km (62 mi).
- ◉ The mission will carry five instruments on the orbiter.
- ◉ Three of them are new, while two others are improved versions of those flown on Chandrayaan-1.
- ◉ The approximate launch mass will be 2,379 kg.

DESIGN OF CHANDRAYAAN-2

- ◉ The Orbiter High Resolution Camera (OHRC) will conduct high-resolution observations of the landing site prior to separation of the lander from the orbiter. Interfaces between the orbiter and its GSLV Mk II launch vehicle have been finalised. The orbiter's structure was manufactured by Hindustan Aeronautics Limited and delivered to ISRO Satellite Centre.

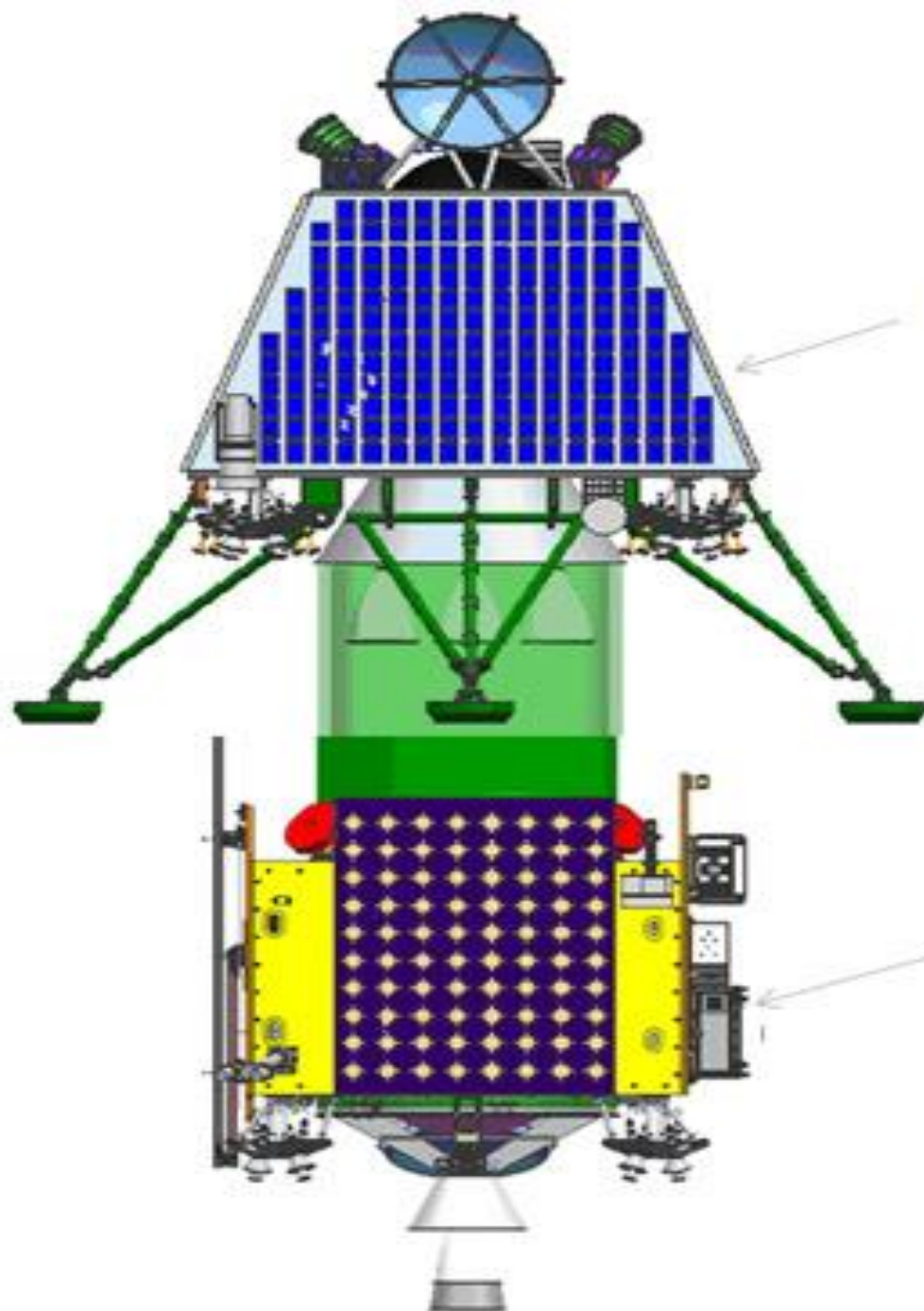
DESIGN OF CHANDRAYAAN-2

VIKRAM LANDER

- ◉ The *Vikram* lander will detach from the orbiter and descend to a lunar orbit of 30 km × 100 km (19 mi × 62 mi) .
- ◉ It will then perform a comprehensive check of all its on-board systems before attempting to land on the lunar surface.

DESIGN OF CHANDRAYAAN-2

- ◉ The *Vikram* lander will make a soft landing. deploy the rover, and perform some scientific activities for approximately 15 days.
- ◉ The approximate combined mass of the lander and rover is 1,471 kg
- ◉ Some associated technologies include a high resolution camera, navigation camera, and the software needed to run these components.



Lander

Orbiter craft

DESIGN OF CHANDRAYAAN-2

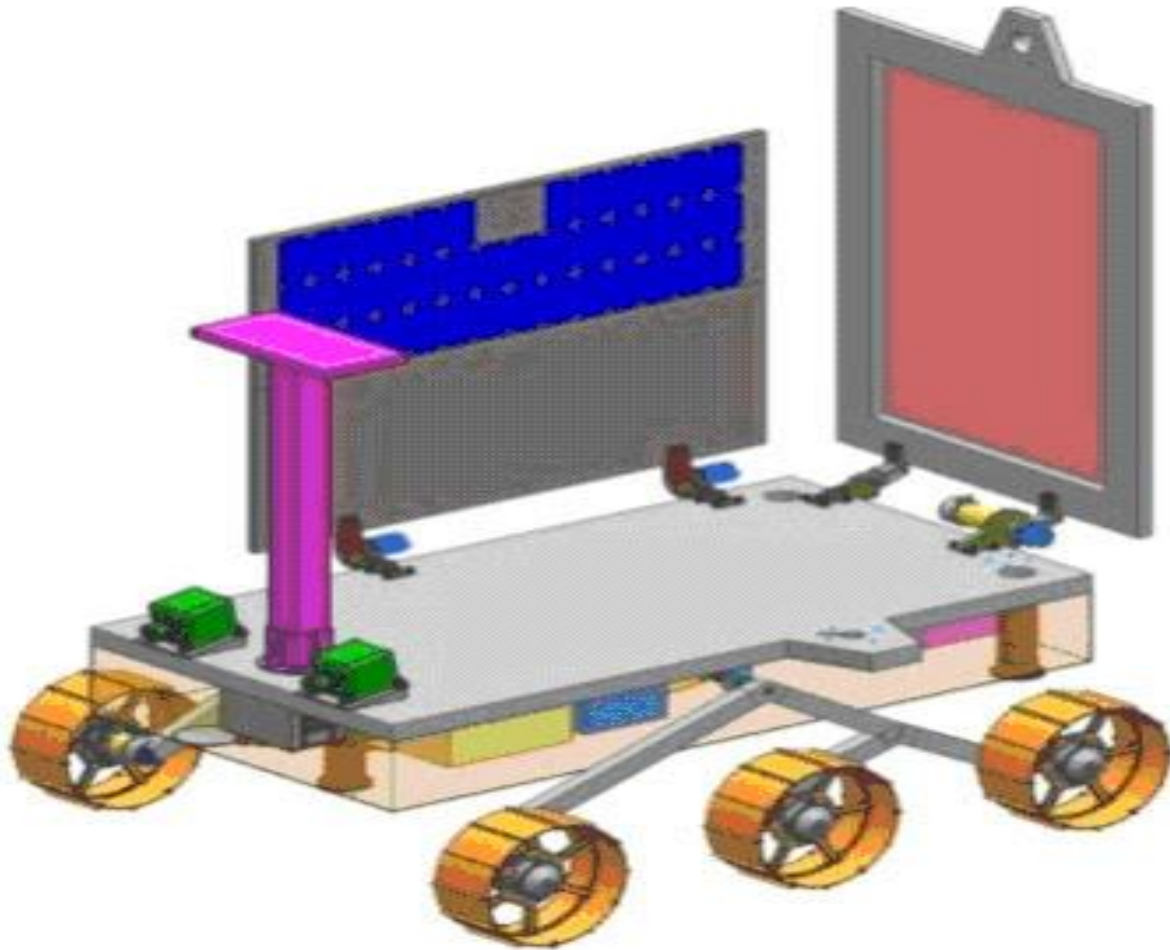
ROVER

- ◉ The rover's mass will be about 27 kg.
- ◉ It will operate on solar power.
- ◉ The rover will move on 6 wheels on the lunar surface, perform on-site chemical analysis and send the data to the orbiter above, which will relay it to the Earth station.

DESIGN OF CHANDRAYAAN-2

- ◉ The initial plan was for the rover to be designed in Russia and fabricated in India. However, after Russia proved unable to contribute to the mission.
- ◉ IIT Kanpur is developing three subsystems to provide mobility.

ROVER:



PAYLOAD

- ◉ ISRO selected five scientific instruments for the orbiter, four for the lander, and two for the rover.
- ◉ It was initially reported that NASA and ESA would participate in the mission by providing some scientific instruments for the orbiter.
- ◉ ISRO has later clarified that due to weight restrictions it will not be carrying foreign payloads on this mission

PAYLOAD: ORBITER PAYLOAD

- ◉ Large Area Soft X-ray Spectrometer :for mapping major elements present on the lunar surface.
- ◉ Imaging IR Spectrometer (IIRS): for mapping of lunar surface over a wide wavelength range for the study of minerals, water molecules and hydroxyl present.

PAYLOAD:VIKRAM PAYLOAD

- ◉ Seismometer for studying Moon-quakes near the landing site
- ◉ Thermal probe for estimating the thermal properties of the lunar surface.
- ◉ Radio occultation experiment for measuring the total electron content.

PAYLOAD: ROVER PAYLOAD

- ◉ Laser induced Breakdown Spectroscope (LIBS) from Laboratory for Electro Optic Systems (LEOS), Bangalore.
- ◉ Alpha Particle Induced X-ray Spectroscope (APIXS) from PRL, Ahmedabad.

Thank you

